

Biology A

General Certificate of Secondary Education

Unit **A221/01**: Unit 1: Modules B1, B2, B3 (Foundation Tier)

Mark Scheme for January 2011

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, eg mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/ = alternative and acceptable answers for the same marking point
 (1) = separates marking points
not/reject = answers which are not worthy of credit
ignore = statements which are irrelevant - applies to neutral answers
allow/accept = answers that can be accepted
 (words) = words which are not essential to gain credit
words = underlined words must be present in answer to score a mark
 ecf = error carried forward
 AW/owtte = alternative wording
 ORA = or reverse argument

eg mark scheme shows ‘work done in lifting / (change in) gravitational potential energy’ (1)
“work done” = 0 marks
“work done lifting” = 1 mark
“change in potential energy” = 0 marks
“gravitational potential energy” = 1 mark

5. If a candidate alters his/her response, examiners should accept the alteration.
6. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

The example below illustrates how to apply this principle to an objective question.

eg for a one mark question, where ticks in boxes 3 and 4 are required for the mark

Put ticks (✓) in the two correct boxes.

✓
✗

This would be worth zero marks.

Put ticks (✓) in the two correct boxes.

✗
✗

This would be worth one mark.

Put ticks (✓) in the two correct boxes.

✗
✗
✓
✓

This would be worth one mark.

7. The list principle:

If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, eg one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

8. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, eg shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

eg if a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question		Expected Answers	Marks	Additional Guidance
1	a	one copy (1) the same (1) alleles (1)	[3]	
	b	any two from: idea of half the alleles from each parent; idea of different genes/alleles/chromosomes (produce different results); correct example of environmental factor;	[2]	accept max. 1 = environmental factor
Total			[5]	

Question		Expected Answers	Marks	Additional Guidance
2	a	i	idea that cystic fibrosis has only 1 or 2 genes or alleles (1) idea that eye colour has multiple or more genes or alleles (1)	[2] accept continuous (eye colour) and discontinuous (CF) variation ignore any reference to dominant and recessive
		ii	any two from: thick/sticky mucus or mucus build up; cough / lung infections; breathing problems; sterility; digestive problems / poor growth;	[2]
	b	any two from: whether or not to have children (1) whether to terminate pregnancy (1) chance of miscarriage / harm fetus; risk of test eg infection; test may give false result so still unsure/unreliable; may affect (life) insurance; whether or not to have gene therapy;	[2]	ignore non implications eg a fetus cannot make the decision ignore do not want to know / causes stress / can plan your life ignore can receive treatment
	c	i	Mandy (1)	[1]
		ii	Dan (1)	[1]
Total			[8]	

Question			Expected Answers	Marks	Additional Guidance
3	a	i	3 and 5 (1)	[1]	both required for mark accept either way round
		ii	3 - it encourages the body to make <u>antibodies/antitoxin</u> to destroy the virus / owtte (1) 5 - the new vaccine would enable the body to destroy the flu (virus) entering the body(1)	[2]	Mark whole of this response independently of 3ai OWTTE accept either way round OWTTE accept either way round For sentence 5 look for the idea that the vaccine would not work on any other virus i.e. just the flu virus reject idea that vaccine stops flu virus entering the body
	b		Vaccines can never be ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Once the body has made the ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/> Symptoms of the disease are ... <input checked="" type="checkbox"/> (1)	[3]	
Total				[6]	

Question		Expected Answers	Marks	Additional Guidance
4	a	<input type="checkbox"/> <input type="checkbox"/> Antibiotics do not work ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/> Steve's sore throat is not ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	[2]	
	b	<input type="checkbox"/> <input type="checkbox"/> To stop the bacteria becoming ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	[1]	
	c	C, E and A (in the three boxes) (1) C, E and A in correct order (1)	[2]	

Question		Expected Answers	Marks	Additional Guidance
4	d	<p>... not been peer reviewed ... <input type="checkbox"/></p> <p>... not been peer reviewed ... <input checked="" type="checkbox"/> (1)</p> <p>... not been peer reviewed ... <input type="checkbox"/></p> <p>... not been peer reviewed ... <input type="checkbox"/></p> <p>... not been peer reviewed ... <input type="checkbox"/></p> <p>... have not been repeated ... <input checked="" type="checkbox"/> (1)</p>	[2]	
		Total	[7]	

Question		Expected Answers	Marks	Additional Guidance												
5	a	<table border="0"> <tr> <td style="text-align: center;">blood vessel</td> <td style="text-align: center;">feature</td> <td style="text-align: center;">function</td> </tr> <tr> <td style="text-align: center;">artery</td> <td style="text-align: center;">valves along its length</td> <td style="text-align: center;">allow blood to flow easily</td> </tr> <tr> <td style="text-align: center;">vein</td> <td style="text-align: center;">muscular wall</td> <td style="text-align: center;">maintain blood pressure</td> </tr> <tr> <td></td> <td style="text-align: center;">large lumen</td> <td style="text-align: center;">stop blood flowing backwards</td> </tr> </table>	blood vessel	feature	function	artery	valves along its length	allow blood to flow easily	vein	muscular wall	maintain blood pressure		large lumen	stop blood flowing backwards	[2]	1 mark for left hand side correct 1 mark for right hand side correct Allow 1 mark for any three correct lines
blood vessel	feature	function														
artery	valves along its length	allow blood to flow easily														
vein	muscular wall	maintain blood pressure														
	large lumen	stop blood flowing backwards														
	b	<table border="0"> <tr> <td style="text-align: right;">... needs lots of oxygen and ...</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>(1)</td> </tr> <tr> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> </table>	... needs lots of oxygen and ...	<input type="checkbox"/>			<input type="checkbox"/>			<input checked="" type="checkbox"/>	(1)		<input type="checkbox"/>		[1]	
... needs lots of oxygen and ...	<input type="checkbox"/>															
	<input type="checkbox"/>															
	<input checked="" type="checkbox"/>	(1)														
	<input type="checkbox"/>															
	c	i	[2]													
		any two from: diet / obesity; lack of exercise; genetic factors; stress; excessive alcohol; advanced age; high cholesterol;														
		ii	[2]													
		is an individual case (1) need lots of results (to see pattern/trend) (1)														
Total			[7]													

Question		Expected Answers	Marks	Additional Guidance
6	a	3500 (1) molecules that could copy themselves (1) simple (1)	[3]	
	b	<div style="text-align: right; margin-right: 20px;"><input type="checkbox"/></div> Variation is caused by ... <input checked="" type="checkbox"/> (1) If conditions on Earth ... <input checked="" type="checkbox"/> (1) <div style="text-align: right; margin-right: 20px;"><input type="checkbox"/></div> <div style="text-align: right; margin-right: 20px;"><input type="checkbox"/></div> The fossil record provides ... <input checked="" type="checkbox"/> (1) <div style="text-align: right; margin-right: 20px;"><input type="checkbox"/></div>	[3]	
		Total	[6]	

Question	Expected Answers	Marks	Additional Guidance																																
7	<table border="1"> <thead> <tr> <th data-bbox="331 276 499 309">statement</th> <th data-bbox="499 276 640 309">nerves</th> <th data-bbox="640 276 786 309">hormones</th> <th data-bbox="786 276 931 309">both</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 325 499 359">... neurons</td> <td data-bbox="499 325 640 359">✓</td> <td data-bbox="640 325 786 359"></td> <td data-bbox="786 325 931 359"></td> </tr> <tr> <td data-bbox="331 375 499 408">... impulses</td> <td data-bbox="499 375 640 408">✓</td> <td data-bbox="640 375 786 408"></td> <td data-bbox="786 375 931 408"></td> </tr> <tr> <td data-bbox="331 424 499 458">... response</td> <td data-bbox="499 424 640 458">✓</td> <td data-bbox="640 424 786 458"></td> <td data-bbox="786 424 931 458"></td> </tr> <tr> <td data-bbox="331 474 499 507">communication</td> <td data-bbox="499 474 640 507"></td> <td data-bbox="640 474 786 507"></td> <td data-bbox="786 474 931 507">✓</td> </tr> <tr> <td data-bbox="331 523 499 557">... travel</td> <td data-bbox="499 523 640 557"></td> <td data-bbox="640 523 786 557">✓</td> <td data-bbox="786 523 931 557"></td> </tr> <tr> <td data-bbox="331 572 499 606">... long</td> <td data-bbox="499 572 640 606"></td> <td data-bbox="640 572 786 606">✓</td> <td data-bbox="786 572 931 606"></td> </tr> <tr> <td data-bbox="331 622 499 655">... slow</td> <td data-bbox="499 622 640 655"></td> <td data-bbox="640 622 786 655">✓</td> <td data-bbox="786 622 931 655"></td> </tr> </tbody> </table>	statement	nerves	hormones	both	... neurons	✓			... impulses	✓			... response	✓			communication			✓	... travel		✓		... long		✓		... slow		✓		[3]	7 correct rows = 3 marks 6 correct rows = 2 marks 5 correct rows = 1 mark
statement	nerves	hormones	both																																
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